

Railway Interlocking Plant in Portugal

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The first railway interlocking plant in Portugal on the Signalbolag system was built at Ermezinde station near Oporto and was described in Ericsson Review No 4, 1937. Since this plant has been completed Compañía Española Ericsson has received an order for another plant for the same railway at Rio Tinto station, situated on the double track line between Ermezinde and Oporto. The erection of this plant was completed during last year.

The interlocking plant at Rio Tinto is of the relay switching type with central press button operation and operated entirely electrically without dependence on any mechanical device. The plant comprises only some ten signals and about the same number of point machines.

The control apparatus is installed in the station building, Fig. 1, and is built into the wall between the office room and the relay room in such a manner that the front of the apparatus is in the office and the back with the line terminals is in the relay room. The front of the control apparatus consists of a vertical bay, divided into two panels, the upper of which contains an illuminated track diagram and the lower one the control buttons and the control switches. Below the control panel the apparatus forms a desk for the train dispatcher, see Fig. 2.

The illuminated track diagram has a skeleton track system of bright metal strips and is provided with pilot lamps for supervising the signal lights, the point positions, the track circuits and the train roads. The pilot lamps on the diagram are placed alongside the tracks and combine to form miniature signals.

Each point has three marking lamps, one in the bifurcation point of the track and one in each branch of the track. The lamp at the bifurcation point remains constantly lit. Of the other two lamps the lamp is lit which is in the track



Fig. 1
The station building at Rio Tinto

X 5614

for which the points are set, providing that the point machine is locked and the points tongue lies to the rail. If the point is in course of being changed or if it has been forced, then only the lamp at the bifurcation point is lit.

The track circuit lamps show which of the station track sections are free and which are occupied by trains or rolling stock.

The train road lamps light up when the train road lever has been thrown, provided the train road locking relay is energised, the train road points are in proper position and the track circuits required to be free for the train road are unoccupied; after the train road has been locked and the signals set the train road lamp remains lit until the train road has been released.

The control panel comprises all the buttons and switches for the operation of the plant, with the exception of the equipment required for control of the power plant. The panel is provided with two point changing buttons for each single point and for each pair of coupled points and in addition has two signal buttons for each home, starting and shunting signal, by means of which these may be set at «clear» or «stop».

A locked train road which for some reason has not been released by a train may be released by special release buttons, which are normally kept sealed. In this plant there are also special switches which in home position break the current circuit to the train road relays; these train road switches must be thrown before a train road can be locked and the signals set.

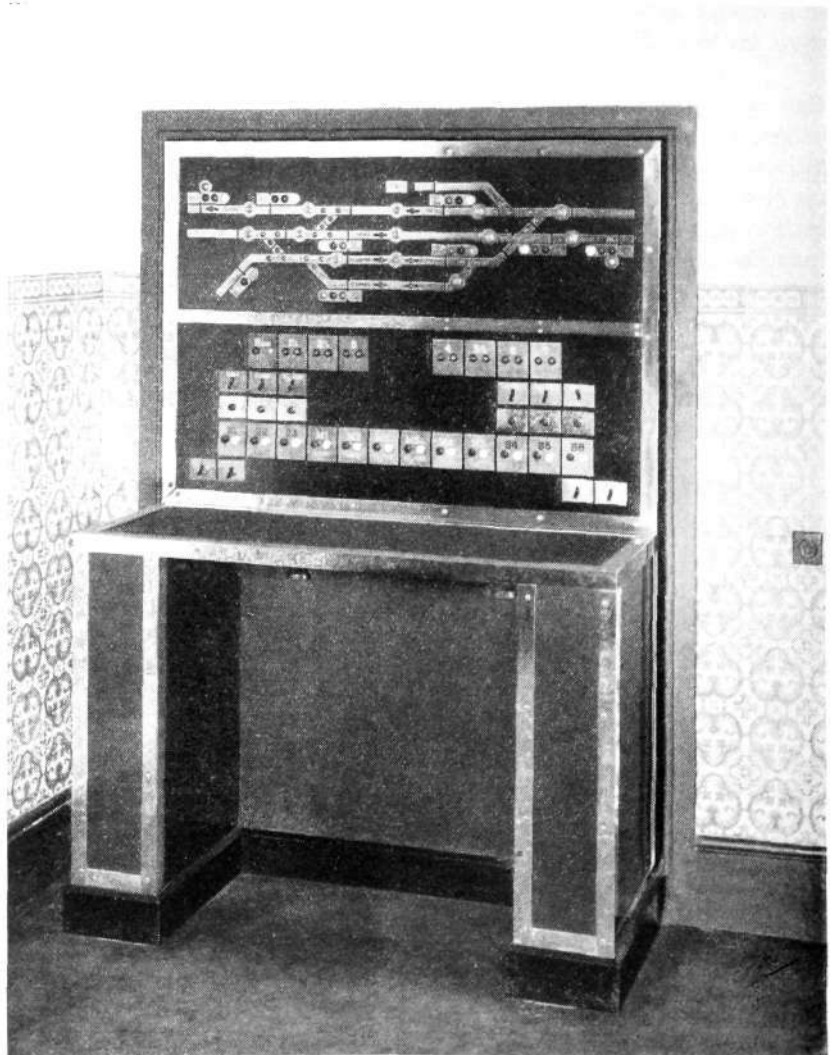


Fig. 2
Control apparatus
above, illuminated track diagram; below,
buttons and switches

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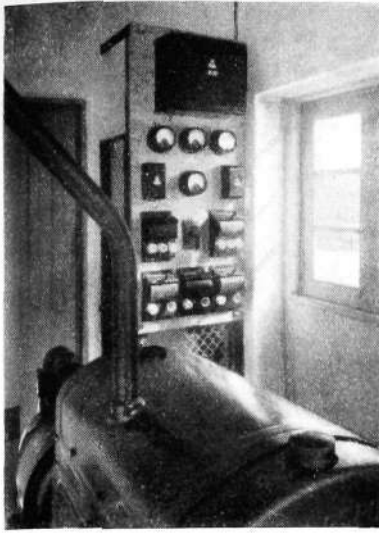


Fig. 3
Power plant

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A through road switch is provided for each main through track. When the plant is not operating the starting, home and distant signals all show red light. When an incoming track is laid and the home signal «clear» button is pressed, both the home and the distant signal change from red to green light. When an outgoing track is laid and the starting «clear» button is pressed, the starting signal changes from red to white. If both home and starting signals for the same train track are set then the distant signal and the home and starting signals will show green, green and white respectively. If the train track through running switch is then thrown, the distant signal and the home signal will change from green to white; the signals of the train track will therefore all show for through running a fixed white light. The distant signal is automatically controlled by the home signal and by the track circuit between the distant signal and the home signal. Nevertheless the distant signal may be set at «stop» at any moment.

The signals are normal daylight signals, though the starting and shunting signals are combined on common masts and with common «stop» light. The starting signal's white «clear» light is placed highest on the mast immediately above the red light, while the yellow shunting light which has a smaller light aperture is placed a little distance down on the mast, so that the two lights will not be confused.

The distant signals are furnished with lamps having blue light, located below and to the left of the signal lights proper. This blue light, which must always be shining and which is supervised by a pilot lamp on the illuminated track diagram, has the purpose of preventing an engine driver going past the signal without observing it if the signal light is unlit for some reason.

The point and track driving devices, the track circuit equipment and the relay equipment are of Signalbolaget's normal design. There is a storage battery charged by a metal rectifier for feeding the DC relays. Normally the plant is connected to the main transformer of the station, but as reserve in the event of failure there is a petrol engine driven three-phase generator, Fig. 3, which is housed in a separate building along with the power plant, close to the station building.